

## **IMC Case: An EBM Approach to Asthma**

A 28 year old African-American man presents to the IMC with a chief complaint of cough. Apparently he has had a cough for the last two years. It seems to get worse in cold weather, when he is exerting himself, and upon exposure to strong odors. He admits to some mild shortness of breath during these episodes, and at times feels like "air is stuck in my chest". He states when he was in high school his pediatrician gave him an inhaler to use before football practice and games because of similar symptoms. He had no issues up until two years ago, when he moved in with his girlfriend and her two cats. The cough and shortness of breath got so bad two weeks ago, that he went to the urgent care center where he was given an albuterol inhaler. He states it really seems to help his symptoms. He states he uses the inhaler about 3 times daily, and at least 3 nights over the last 2 weeks. The patient denies any prior hospitalizations. He does not smoke, but his girlfriend's mother who is a "chain smoker" moved in with them 4 weeks ago. The patient denies any weight loss, fever, chills; occasional "tension" HA; denies dizzy; admits to mild clear rhinorrhea for which he self treats with loratadine; no chest pain, palp; cough and SOB as above, clear to white sputum when productive; no orthopnea or PND, no lower leg edema; no abdominal pain, no N/V/D/C, no dysuria or hematuria, no rash (although he states his mother told him he had eczema as a child), no weakness or numbness in arms or legs.

**PMedHx:** Reactive Airways Disease as child; Allergic rhinitis

**PSurgHx:** Tonsillectomy age 5

**Allergies:** NKDA

**Medications:** albuterol inhaler; loratadine 10 mg daily; Tylenol 325 mg 1 or 2 prn HA (utilized more often since girlfriend's mother moved in)

**Social:** Denies tobacco, alcohol or illicit drug use; works as Manager of local Subway restaurant; denies any occupational exposure to chemicals in past

**Family:** Father alive age 60 with HTN, CAD; Mother alive age 55 with "chronic lung problems, but she smokes"; Brother alive age 32 "uses a puffer as well"

**ROS:** As above

**Vitals:** Afebrile 97.6 78 bpm 16 rpm 128/78 95%RA Ht 74 inch Wt 200 # BMI 25.7

Peak flows 500, 510, 520 (L/min)

**General:** A&Ox3; NAD; Nontoxic; Pleasant; no conversational dyspnea

**HEENT:** PERRL, EOMI, oral mucosa moist, no oral lesions, minimal posterior pharynx drainage noted; TM's clear; nasal turbinates with mild blue hue, edema, 1 polyp noted in left nare

**Neck:** Supple, no JVD, no bruit, no nodes, no thyroidmegaly

**Heart:** RRR no murmurs, gallops or rubs

**Lungs:** Bilateral end expiratory wheeze noted; mild prolongation of expiratory phase; no crackles or rhonchi; overall good air exchange

**Abdomen:** Soft, +BS, NT/ND, No mass, hernia or organomegaly

**Lower leg:** No edema, no calf tenderness, no rash  
**Vascular:** PPP  
**Neuro:** Grossly intact

Please use the link to Asthma guidelines to assist in answering the below questions:

<http://www.nhlbi.nih.gov/files/docs/guidelines/asthsumm.pdf>

1. The patient states he would just like a refill of albuterol which really seems to help him. You tell the patient you believe he has poorly controlled asthma. He asks what asthma is and what causes it?

- What is the working definition of asthma?
- Has a definitive cause of the inflammatory process leading to asthma been established yet?
- What are some of the factors that are believed to cause asthma?
- What are some of our patient's key symptom indicators for considering a diagnosis of asthma?
- Is spirometry needed to establish diagnosis? Are peak flows an acceptable alternative diagnostic tool in Asthma?
- What are some differential diagnostic possibilities for Asthma in adults?

2. You have the MA perform office spirometry on the patient, his FEV1/FVC ratio is 75%, FEV1 is 70% predicted, FEF25-75 70% predicted, post-bronchodilator treatment the FEV1 improves 15% (well over 200 cc improvement). To review interpretation of spirometry, please review the following article:

<http://www.mdedge.com/ccjm/article/93981/pulmonology/interpreting-pulmonary-function-tests-recognize-pattern-and-diagnosis/pdf>

- Is the patient's spirometry consistent with a diagnosis of asthma?
- What percent post-bronchodilator improvement is considered a significant bronchodilator response?

- Utilizing the patient's clinical history and spirometry results, please classify the patient's severity of asthma?(Figure 14 from Guidelines will help)
- Devise a medication treatment regimen for our patient. (Utilize figures 14 and 16 from Guidelines as a quick reference)
- What are the goals of therapy with asthma?
- What are some possible environmental triggers you would advise this patient to attempt to eliminate?
- When would you schedule follow-up with the patient, when would you repeat spirometry?
- When should you consider daily peak flow monitoring for patients?

3. The patient states his friend told him aspirin was the best medication for headaches. He gets very good relief with Tylenol, but wonders if aspirin would be better.

- What would you advise this patient?(hint, page 23 of guideline)
- What are the key educational messages to be taught to patient at this visit, and reinforced at all follow-up visits?(hint, box on page 18 of guidelines)

4. You just have reviewed all the above with your attending in the IMC bullpen. The patient's girlfriend's mother (who drove him to IMC), became upset at how long the appointment was taking, and had the MA take her back to the patient's room. She sprayed a bunch of perfume onto herself in the exam room. You note the patient is now coughing strenuously, and speaking in 4 or 5 word sentences. His vitals are stable, pulse ox 94%RA and 18bpm, and exam shows diffuse wheezing. You have the mother return to the waiting room. The patient is moved to a different exam room, and you ask the MA to give a stat aerosol treatment.

- What are some risk factors for asthma-related death from exacerbations?

- Please define the different levels of severity of exacerbations, and what treatment options are available for each. (hint – see figure 20 and 21 of guidelines)

5. The patient is feeling much better in the new exam room after 2 albuterol aerosol treatments. You ambulate him around the clinic, and he says he still feels a little “tight”. Pulse ox and vitals are stable. Exam shows decreased wheezing and improved air exchange since aerosols, but still more wheezing than on initial exam.

- What additional medication would you add at this time?
- Would you send the patient to the ER now?

6. The patient calls you 2 weeks later, he has finished his prednisone 40 mg daily, and is tolerating his Flovent HFA 110mcg 2 puffs bid (he is remembering to rinse his mouth after each use as you have instructed). He has only used his albuterol inhaler once over the last 7 days. His girlfriend made her mother move out when she heard the mother’s smoking and perfume were possibly contributing to the patient’s problems. The mother also was willing to take the cats. The patient states he will keep his appointment with you scheduled for next week.

**Bonus** – Calculate our patient’s predicted peak flow

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